

C L A I M S :

1. A bicontinuous one-phase microemulsion at least consisting of an aqueous component (A), a hydrophobic component (B) and an amphiphilic component (C/D), wherein said microemulsion simultaneously comprises a continuous aqueous phase and a continuous hydrophobic phase, and the hydrophobic component (B) contains one or more substances which can be employed as a fuel.
2. The microemulsion according to claim 1, wherein said aqueous component (A)
  - (i) is selected from water and alcohol-water mixtures; and/or
  - (ii) contains from 10 to 100% by weight, preferably from 70 to 100% by weight, more preferably from 80 to 100% by weight, of water; and/or
  - (iii) contains additional salts and additives (E) selected from the group consisting of alkali halides, ammonium halides, ammonium salts or organic acids and urea derivatives, preferably ammonium salts or organic acids, more preferably ammonium carbonate and ammonium acetate, the additives (E) being present in concentrations of from 0 to 4% by weight, based on the total microemulsion, preferably from 0.01 to 2.5% by weight, more preferably from 0.05 to 1.5% by weight, even more preferably from 0.05 to 1.2% by weight.
3. The microemulsion according to claim 1 or 2, wherein said hydrophobic component (B) contains:
  - (i) at least one mineral oil-based fuel, preferably selected from the group consisting of gasoline and premium gasoline, diesel fuel, heavy oil, kerosine, petroleum and fuel oil; and/or

(ii) at least one fuel based on vegetable oils or their derivatives, especially selected from biodiesel fuel, rapeseed methyl ester (RME) and bio-oil.

4. The microemulsion according to claim 3, wherein said hydrophobic component (B) contains diesel fuel as a component, preferably

(i) pure diesel fuel; or

(ii) a mixture of diesel fuel, gasoline or premium gasoline on the one hand with bio-oil and/or biodiesel fuel on the other hand in any mixing ratios, more preferably pure diesel fuel or a mixture of diesel fuel and biodiesel fuel and/or bio-oil.

5. The microemulsion according to one or more of claims 1 to 4:

(i) which is electrically conductive and/or thermodynamically stable and/or temperature-stable; and/or

(ii) in which the proportion of amphiphilic component (C/D) is from 0.5 to 20% by weight, preferably from 0.5 to 15% by weight, more preferably from 1 to 8% by weight, even more preferably from 1 to 5% by weight; and/or

(iii) in which the proportion of aqueous component (A) is from 0.5 to 65% by weight, preferably from 5 to 55% by weight, more preferably from 15 to 45% by weight; and/or

(iv) in which the proportion of hydrophobic component (B) is from 4 to 99% by weight, preferably from 45 to 99% by weight, more preferably from 45 to 90% by weight, even more preferably from 60 to 90% by weight.

6. The microemulsion according to one or more of claims 1 to 5, wherein said amphiphilic component (C/D) contains at least one non-ionic surfactant (C), wherein said non-ionic surfactant is preferably selected from
  - (i) linear or branched surfactants (C-1), especially polyethylene oxide and polypropylene oxide derivatives of organic alcohols, organic phosphate esters, alkylphenol ethoxylates, mono- or polyalkylated polyethylene glycerides (PEG) and polypropylene glycols (PPG), preferably polyethylene oxide derivatives of organic alcohols, more preferably with carbon chain lengths of 10-20 carbon atoms and 4-10 ethylene oxide moieties; and/or
  - (ii) surfactants with a core structure (C-2), especially sugar surfactants, preferably selected from the group consisting of alkylglucosides ( $C_nG_j$ ), (poly)alkylsorbitans ( $C_nS_j$ ), alkylmaltosides ( $C_nM_j$ ), alkyl-lactosides and their ethoxylated and propoxylated derivatives, more preferably alkylsorbitans.
7. The microemulsion according to claim 7, wherein said amphiphilic component (C/D) additionally contains at least
  - (i) an ionic surfactant (D), especially a sulfur-free ionic surfactant (D), preferably selected from the group consisting of alkylethanolamines, alkyldiethanolamines, alkylamines, carboxylic acids, alkyl sulfates and alkyl sulfosuccinates and their respective salts, more preferably alkylamines as well as carboxylic acids and their salts, even more preferably fatty acids and alkylamines with 12-20 carbon atoms; and/or
  - (ii) a cosurfactant (C-3), especially selected from aliphatic alcohols, preferably fatty alcohols; and/or

- (iii) an efficiency booster (C-4) selected from amphiphilic block copolymers.
8. The microemulsion according to claim 6 or 7, wherein said amphiphilic component (C/D) contains at least, in addition to a linear or branched surfactant (C-1):
- (i) an ionic surfactant (D); and/or
  - (ii) a sugar surfactant (C-2); and/or
  - (iii) an alcohol, preferably a medium-chain or long-chain alcohol; and
  - (iv) the proportion of component (C) comprising components from the groups (C-1), (C-2), C-3) and (C-4), based on the amphiphilic component (C/D), is from 50 to 100% by weight, preferably from 60 to 80% by weight, more preferably from 65 to 75% by weight; and/or
  - (iv) the proportion of component (C-2), based on the total amount of component (C), is from 0 to 85% by weight, preferably from 10 to 60% by weight, more preferably from 20 to 55% by weight, even more preferably from 35 to 55% by weight.
9. The microemulsion according to one or more of claims 1 to 8, wherein component (A) is water or a water-ethanol mixture, component (B) is diesel fuel, component (C) comprises at least one polyethoxylated long-chain alcohol, and wherein the proportion of (C) in the microemulsion is from 1 to 10% by weight.
10. The microemulsion according to claim 9, wherein (A) is water, (C) is a polyethoxylated C<sub>13</sub> oxo alcohol (C<sub>12/14</sub>E<sub>5</sub>), and (E) is ammonium carbonate, and preferably:

- (i) (D) is AOT, and more preferably the following proportions of the components are present: (A) from 1 to 50% by weight; (B) from 30 to 93% by weight; (C) from 3 to 18% by weight; (D) from 1 to 8% by weight; and (E) from 0.06 to 1.3% by weight; and/or
  - (ii) (D) is a mixture of oleic acid and dodecylamine, and more preferably the following proportions of the components are present: (A) from 5 to 25% by weight; (B) from 79 to 91% by weight; (C) from 2.2 to 7.2% by weight; (D) from 0.45 to 1.2% by weight of oleic acid, from 0.3 to 1% by weight of dodecylamine; (E) from 0.15 to 1.2% by weight.
- 11. The microemulsion according to claim 9, wherein (C) is a polyethoxylated decanol ( $C_{10}E_8$ ) in combination with sorbitan monooleate, and preferably:
  - (i) the following proportions of the components are present: (A) from 39 to 55% by weight; (B) from 34 to 47% by weight; (C)  $C_{10}E_8$  from 4.2 to 10.5% by weight and sorbitan monooleate from 2.8 to 9% by weight; and/or
  - (ii) (A) contains ethanol, and the ethanol content in the microemulsion is more preferably from 2.0 to 7.4% by weight.
- 12. The microemulsion according to claim 9, wherein (A) is water, (C) is a polyethoxylated  $C_{13}$  oxo alcohol ( $C_{12/14}E_5$ ), (D) is AOT, and preferably:
  - (i) (E) is sodium chloride, and more preferably the following proportions of the components are present: (A) from 4 to 55% by weight; (B) from 37 to 86% by weight; (C) from 3.5 to 12% by weight; (D) from 3.3 to 8.2% by weight; and (E) from 0.08 to 0.3% by weight; and/or
  - (ii) (E) is sodium chloride and urea, and more preferably the following proportions of the components are present: (A) from 6 to 10% by weight; (B) from 75 to 85% by weight; (C) from 8 to 12% by weight;

(D) from 4 to 6% by weight; (E) from 0.15 to 0.25% by weight of NaCl, from 0.12 to 0.20% by weight of urea; and/or

(iii) (E) is ammonium acetate, and more preferably the following proportions of the components are present: (A) from 4 to 12.5% by weight; (B) from 68 to 86% by weight; (C) from 6.7 to 12.0% by weight; (D) from 3.3 to 6.0% by weight; (E) from 0.09 to 0.4% by weight.

13. The microemulsion according to claim 9, wherein (A) is water, (C) is a polyethoxylated  $C_{13}$  oxo alcohol ( $C_{12/14}E_6$ ), (D) is ammonium oleate, and (E) is ammonium acetate, and preferably the following proportions of the components are present: (A) from 40 to 60% by weight; (B) from 40 to 60% by weight; (C) from 1.5 to 2.5% by weight; (D) from 1.5 to 2.5% by weight; and (E) from 0.6 to 1.6% by weight.
14. The microemulsion according to claim 9, wherein (A) is water, (C) is a polyethoxylated  $C_{13}$  oxo alcohol ( $C_{12/14}E_5$ ) and a further polyethoxylated alcohol, preferably a polyethoxylated  $C_{13}$  oxo alcohol ( $C_{12/14}E_3$ ), and preferably the following proportions of the components are present: (A) from 40 to 52% by weight; (B) from 40 to 52% by weight; (C) from 3.0 to 8.0% for each individual component.
15. The microemulsion according to one or more of claims 1 to 14, which is a fuel.
16. Use of the microemulsion as defined in claims 1 to 14:
  - (i) as a fuel in combustion engines, preferably in reciprocating piston engines, rotating piston engines and turbine engines; and/or
  - (ii) as a fuel in thrust engines, preferably in jet engines, turbine jet engines and rocket engines; and/or

- (iii) as a fuel in furnaces, preferably in heating installations and steam generation installations; and/or
  - (iv) in ignition processes; and/or
  - (v) in explosives.
17. A method for the determination and optimization of microemulsions according to one or more of claims 1 to 14, comprising the steps of:
- (i) determining the temperature variance and adjusting the temperature invariance of the one-phase microemulsion by adjusting the content of amphiphilic component (C/D); and
  - (ii) adjusting the water-to-oil ratio within a range of the volume ratio of oil to water plus oil of from 4 to 99% by volume, preferably from 4 to 96% by volume, of the hydrophobic component (B).